

Selective reporting as a tool for antimicrobial stewardship (ASP)



ODLING BLOD 902*10584
 Provtagningsmaterial: **BLOD**
 Remissuppgifter: (uppgifter från originalremiss)
 insatt på meronem efter odling
 grundsjukdom: **infektion, aktuell antibiotika: ciprofloxacin**

Provtagningsdatum: 170320
 Ankomstdatum: 170320
 Utskriftsdatum: 170323

**** Svaret ersätter/kompletterar tidigare svar daterat 170322 ****

Resultat:
 Odling: Växt av

	Preliminärsvår:	170321
E. coli	Slutsvar:	170322
E. coli	Tilläggsvår:	170323
E. coli		

Nytt MIC mecillinam : 0.125 mg/L.
Nytt Resistensbestämningen enligt SIR för mecillinam avser behandling vid okomplicerad urinvägsinfektion.

Cefotaxim	S	S	
Ceftazidim	S	S	
Meropenem	S	S	
Tobramycin	S	S	
Ciprofloxacin	S	R	
Piperac/tazobactam	S		
Trim-sulfa	S	S	
Ceftibuten		S	
Mecillinam			S

(S=känslig, I=nedslätt, R=resistent)

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 Strama VG

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 Infectious disease Physician
 Infektion/SkaS
 Strama VG

A chain of factors influence the final results of culture and treatment



- Before the sample arrive in the lab

- What we do in the lab influence the final report

- Analytic method
- AST-determination method
- AST- algorithm

- **Clinical relevance of findings**

- How do the clinicians act on the response?



ODLING BLOD 902*10584	
Provtagningsmateriel:	170320
BLOD	Arkomstidatum: 170320
Prøveindsigter: <small>analyse for oplysninger</small>	Utskriftsdatum: 170323
* Svare erstattekomplettere tidligere over dateret 170322 **	
Resultat:	
Odling: Vækt av	
<i>E. coli</i>	Prekultivert: 170321
<i>E. coli</i>	Svare: 170322
<i>E. coli</i>	Tilleggsvare: 170323
Nyt	MIC mericilinam : 0.125 mg/L
Nyt	Resistenbestanningen enligt SIRI for mericilinam avser behandling vid okomplicerad urinvegsinfektion.
Cefotaxim	<input type="checkbox"/>
Cefazolidim	<input type="checkbox"/>
Meropenem	<input type="checkbox"/>
Tobramycin	<input type="checkbox"/>
Caprothioam	<input type="checkbox"/>
Piperazobactam	<input type="checkbox"/>
Tilm-sulfu	<input type="checkbox"/>
Cefixim	<input type="checkbox"/>
Mericilinam	<input checked="" type="checkbox"/>

Today:

It is **not** about:

- test chosen
- strain identification methods
- AST (antibiotic susceptibility testing)
 - i.e. what to test

ODLING BLOD 902*10504	Provtagningsdatum: 170320
BLOD	Arvsdatum: 170320
Resensoppløst: Isølge til organismen	Utvaltdatum: 170323
Insett på meronen eller odling	
grundskadon: infektion, akutt antibiotika: ciprofloxacin	
** Svaret er tilgjengelig tidligere svar dateret 170322 **	
Resultat:	
Odling: Vækt av	Publikasjons: 170321
E. coli	
E. coli	Svarer: 170322
E. coli	Tilleggsvar: 170323
Nye	MIC meronem: 0.125 mg/L
Nye	Resistensbestemmelsen enligt SIR for meronem avser behandling ved komplisert urinvegsinfektion.
Cefotaxim	
Cefazolin	
Meropenem	
Tobramycin	
Ciprofloxacin	
Piperacillin/tazobactam	
Trim-sulfam	
Colistin	
Meropenem	
Meropenem	



It is how you forward your primary answer
irrespective what you have done,

you may have done a lot!

A chain of factors influence the final results of culture and treatment



What happens when the report arrives!

ODLING BLOD 902*10584

Provtagningsmaterial: **BLOD** Provtagningsdatum: 170320
Remissuppgifter: (se efter tilläggspapper) Ankomstdatum: 170320
insatt på meronem efter odling Utskriftsdatum: 170323
grundsjukdom: infektion, aktuell antibiotika: ciprofloxacin

*** Svaret ersätter kompletterat tidigare svar daterat 170322 ***

Resultat:

Odling: Växt av

E. coli	Preliminärsv: 170321
E. coli	Slutsv: 170322
E. coli	Tilläggsv: 170323

Nytt MIC meclilnam : 0.125 mg/L.

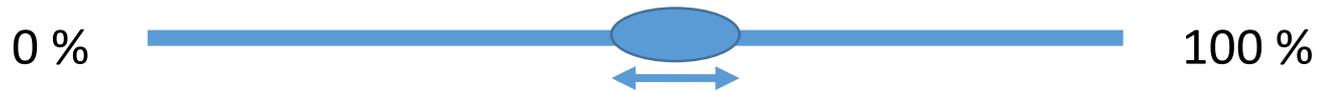
Nytt Resistensbestämningen enligt SIR för meclilnam avser behandling vid okomplicerad urinvägsinfektion.

Cefotaxim	S	S	
Ceftazidim	S	S	
Meropenem	S	S	
Tobramycin	S	S	
Ciprofloxacin	R	R	
Piperacilazobactam	S	S	
Trim-sulta	S	S	
Clotributen	S	S	
Meclilnam			S

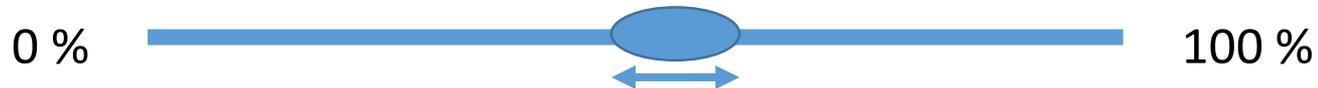
Swedish here – english in the "phone"

Diagnostic ASP

- När odlingssvaret anländer - hur ofta brukar du byta preparat?



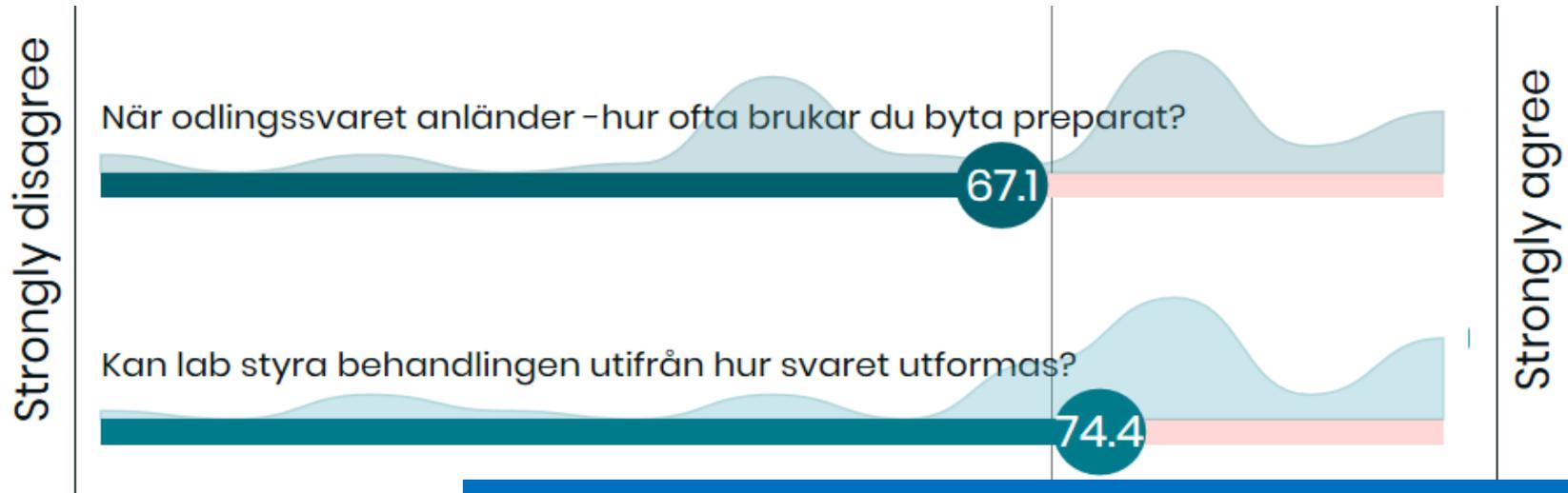
- Kan lab styra behandlingen utifrån hur svaret utformas?



How did those working
in **hospital or primary care** respond

Strama i VGR – educational workshops - responses

Hospital care



Primary care

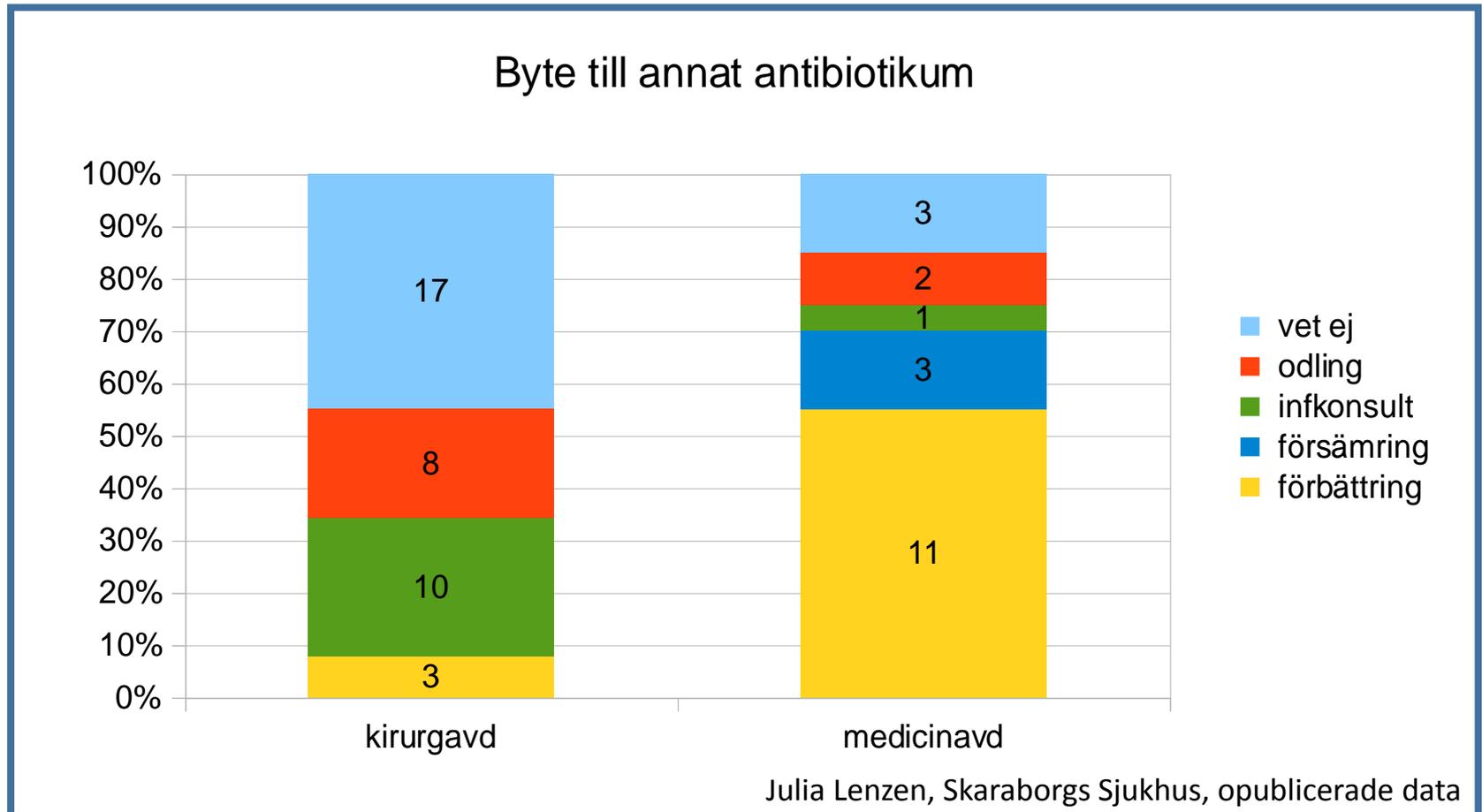
They trust in us



How is laboratory reports used today?



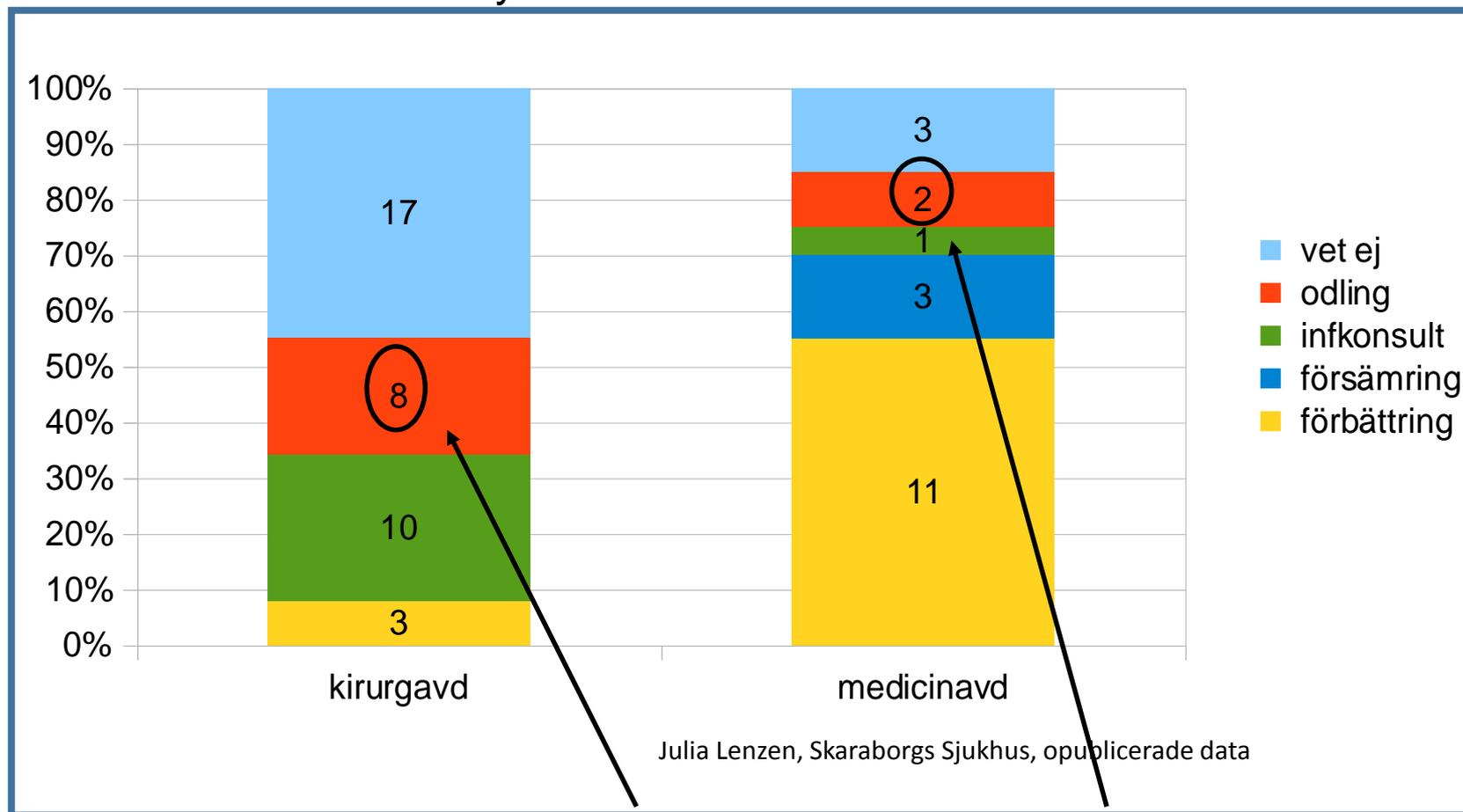
Example: Why do clinicians switch from a cephalosporin to another antibiotic?



How is laboratory reports used today?



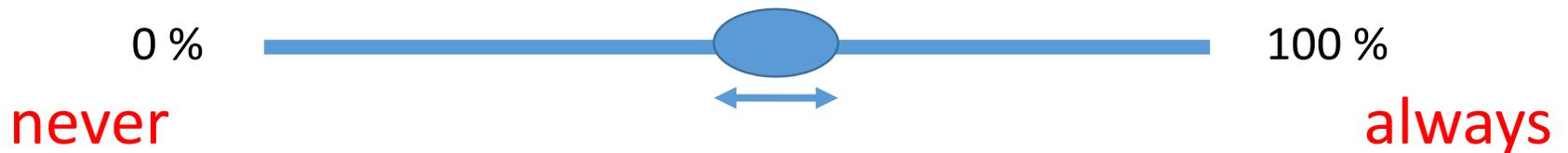
Byte till annat antibiotikum



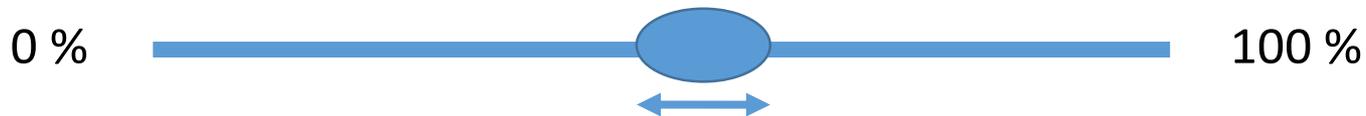
Culture result had an impact in 10 – 20 %!

Is it important with anamnestic information to lab?

- hur ofta saknas remissuppgifter helt på remissen till bakt.lab



- Hur mycket styrs svaret och resistensbestämningen utifrån uppgifter på remissen

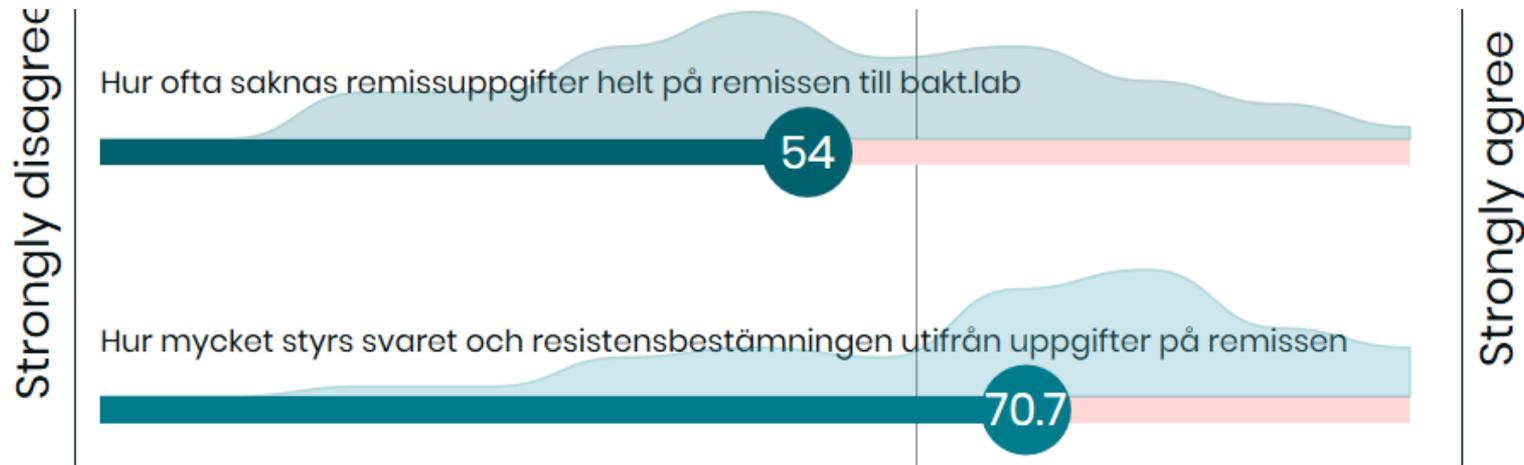


How did those working in **hospital or primary care** respond

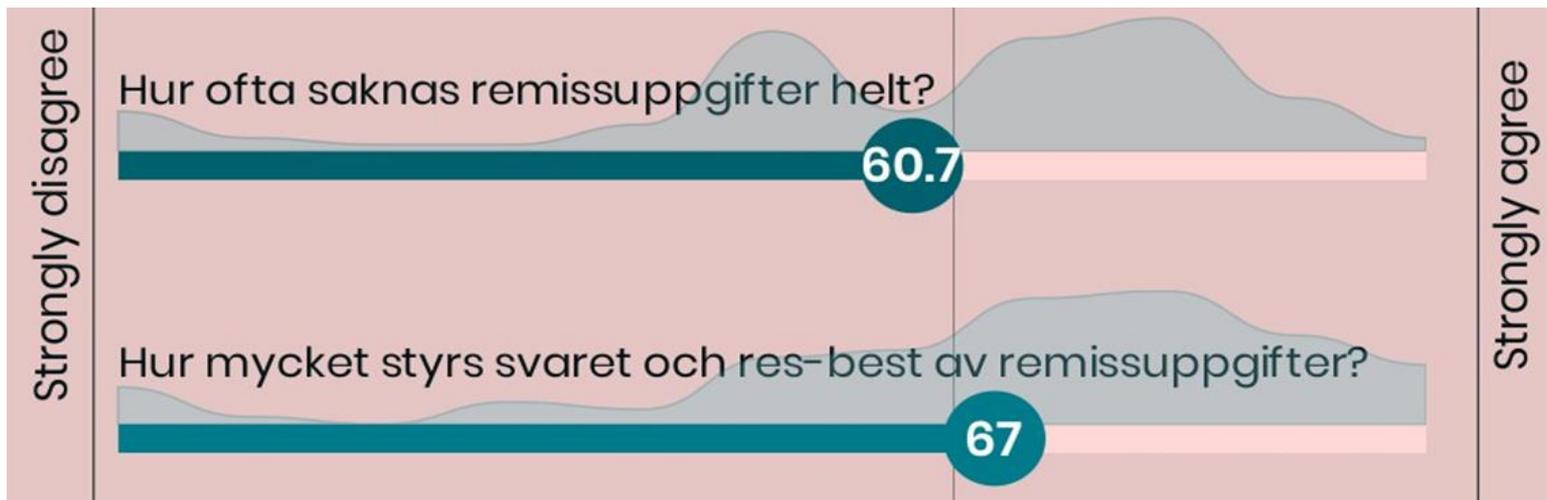
Strama i VGR – educational workshops - responses

Lack of communication??

Hospital care



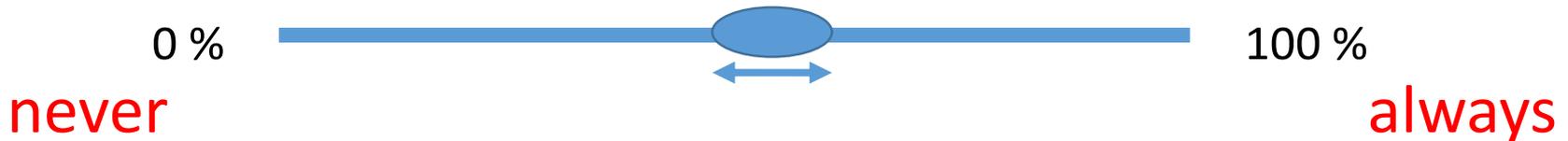
Primary care



Comments on the report

How did those working **hospital or primary care** respond

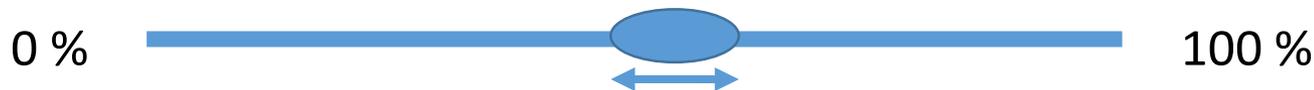
- Handen på hjärtat – hur ofta styrs ditt agerande av en medföljande kommentar på odlingssvaret?



- Hur ofta hade du önskat dig en förklarande kommentar/behandlingsförslag på svaret?



- Vet du t ex vad *Pantoea agglomerans* är för något?



Strama i VGR – educational workshops - responses

Hospital care



Primary care



Typical case

- 67 year old man
- now fever, no other anamnestic information is available
- arrives at ER and a blood culture is drawn, cefotaxime is given



Which response would **YOU** use?



+

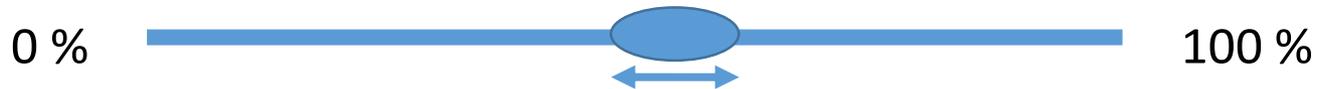


- KNS ¼ bottles,
- Maldi:
S. haemolyticus

- Växt av koagulasnegativ stafylokock (KNS) –
förorening?



- Växt av koagulasnegativ stafylokock (KNS) med
resistensbestämning

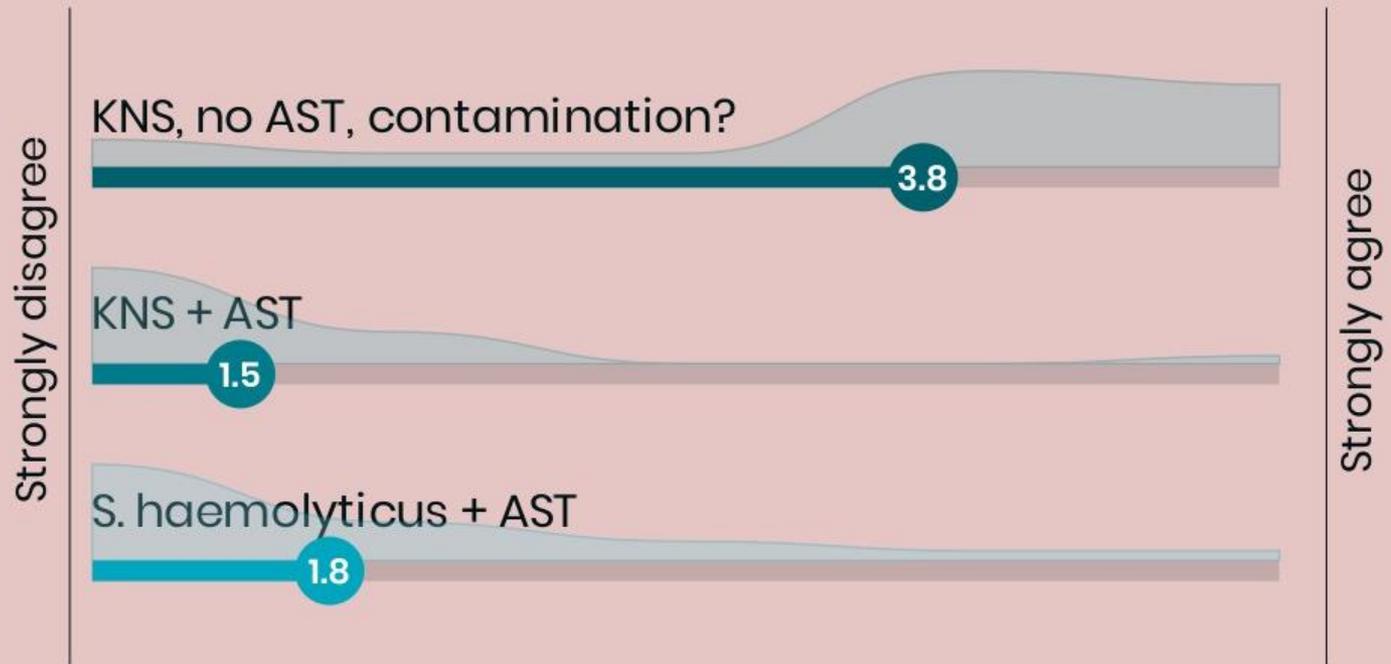


- Växt av S. haemolyticus med resistensbestämning



Respos from auditorium:

Which responde would YOU use



Would you continue with antibiotics?

mark as you believe those working in **hospital care** responded

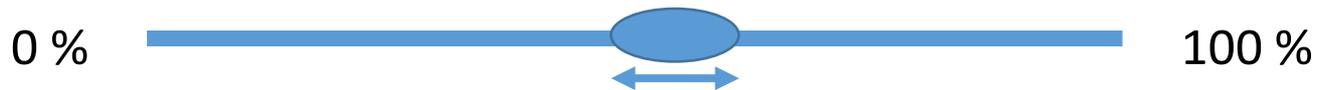


+



- KNS ¼ bottles,
- Maldi:
S haemolyticus

- Växt av koagulasnegativ stafylokock (KNS) –
förorening?



- Växt av koagulasnegativ stafylokock (KNS) med
resistensbestämning



- Växt av S. haemolyticus med resistensbestämning



Strama i VGR – educational workshops – responses hosp care

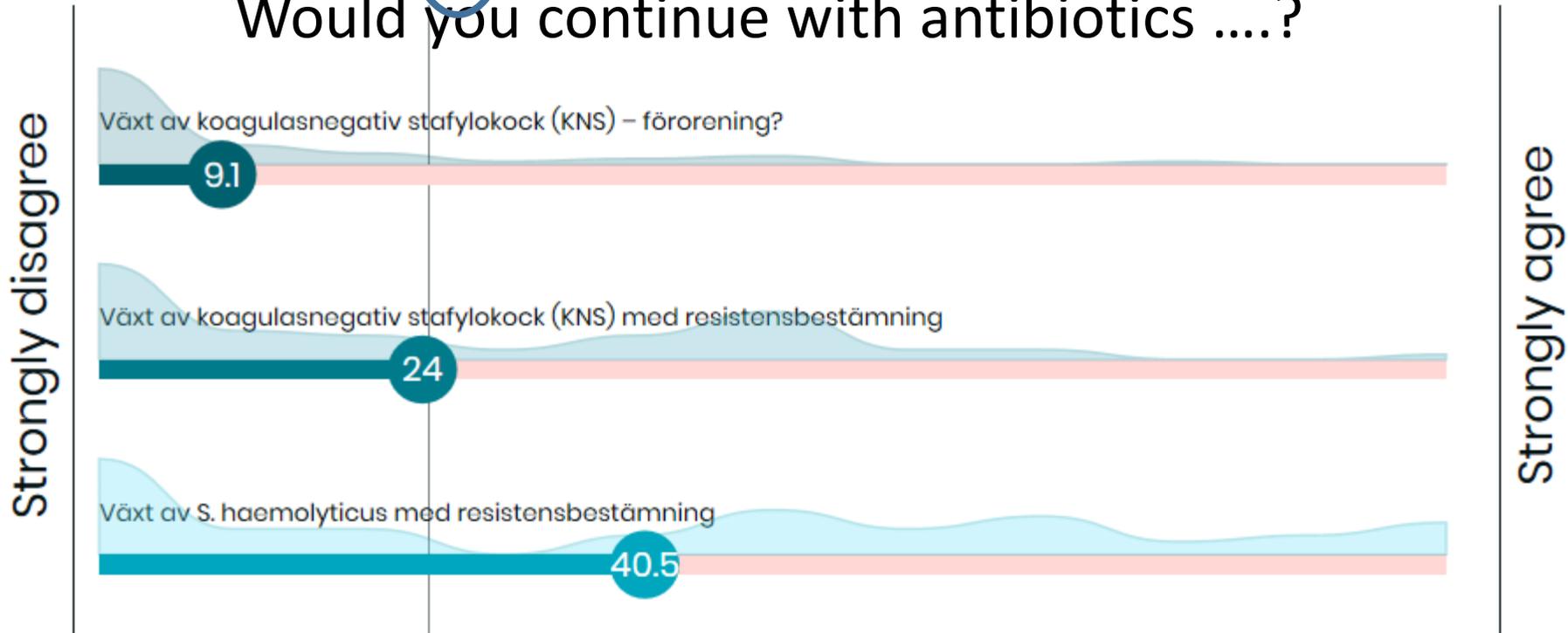


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KNS ¼ bottles

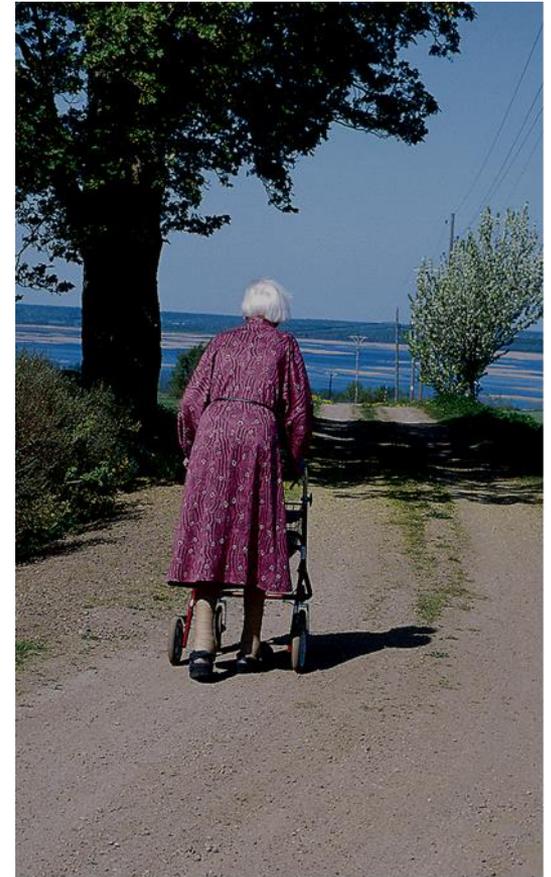
Would you continue with antibiotics?



Refrain from details if the findings most likely are not clinically relevant??

Another case

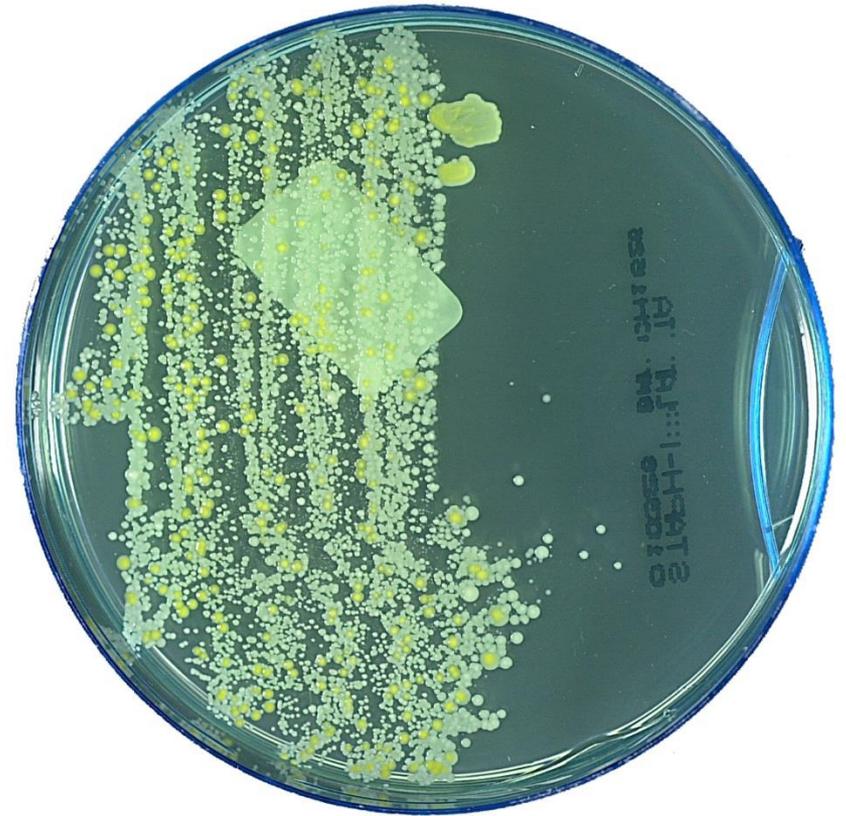
- Elderly lady
- Chronic ulcer on left ankle
- Now symptoms of possible infection
- No fever
- Wound-culture has been taken
- Two alternative ulcers,
but the same anamnesis



First type of ulcer (A)
S. aureus and skin flora



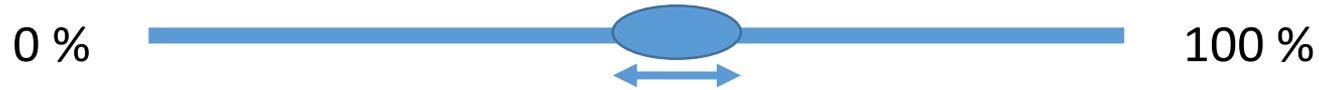
Blood plate



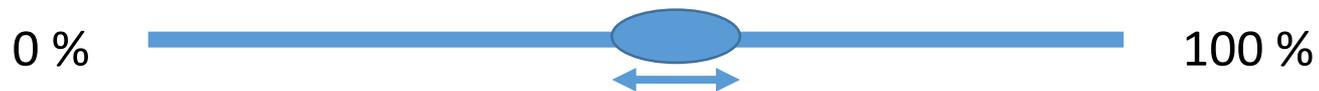
Staph plate

Which response would YOU use?

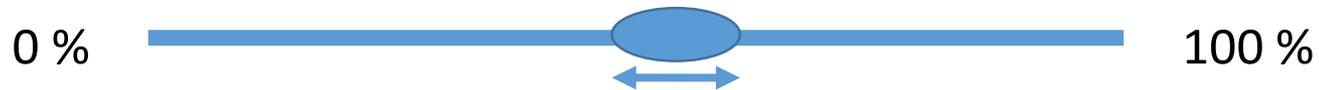
- Staph. aureus, with AST, and skin flora



- As above, but add a comment "relevant finding?"

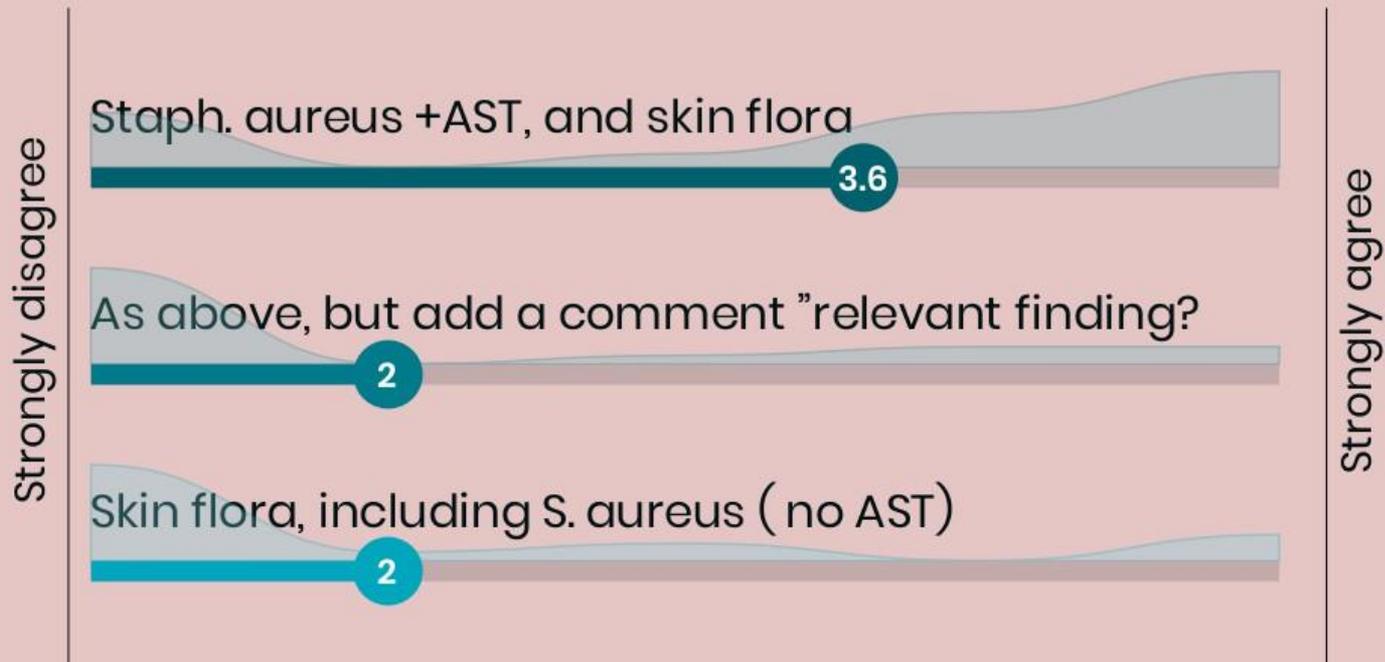


- Skin flora, including S. aureus (no AST)



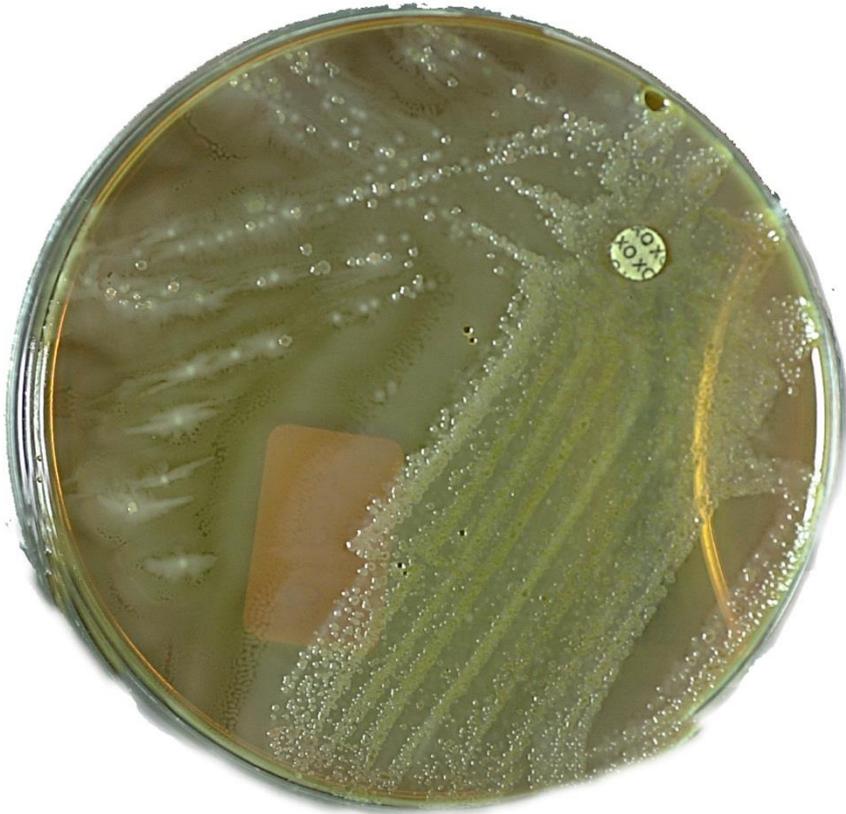
Respos from auditorium:

Which response would YOU use



Second type of ulcer

Pseudomonas + gramnegativ blandflora!



Blood plate



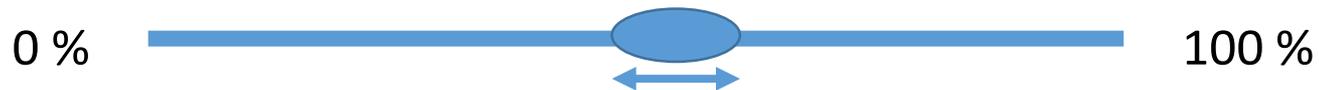
Gram negative plate

Which response would YOU use?

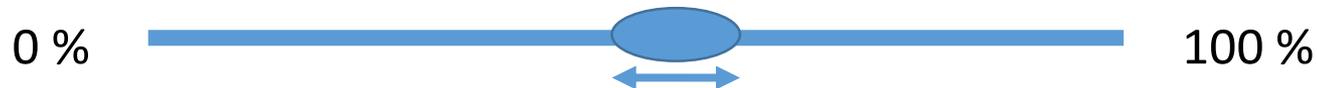
- *P. aeruginosa*, with AST, and skin flora



- As above, but add a comment "relevant finding?"

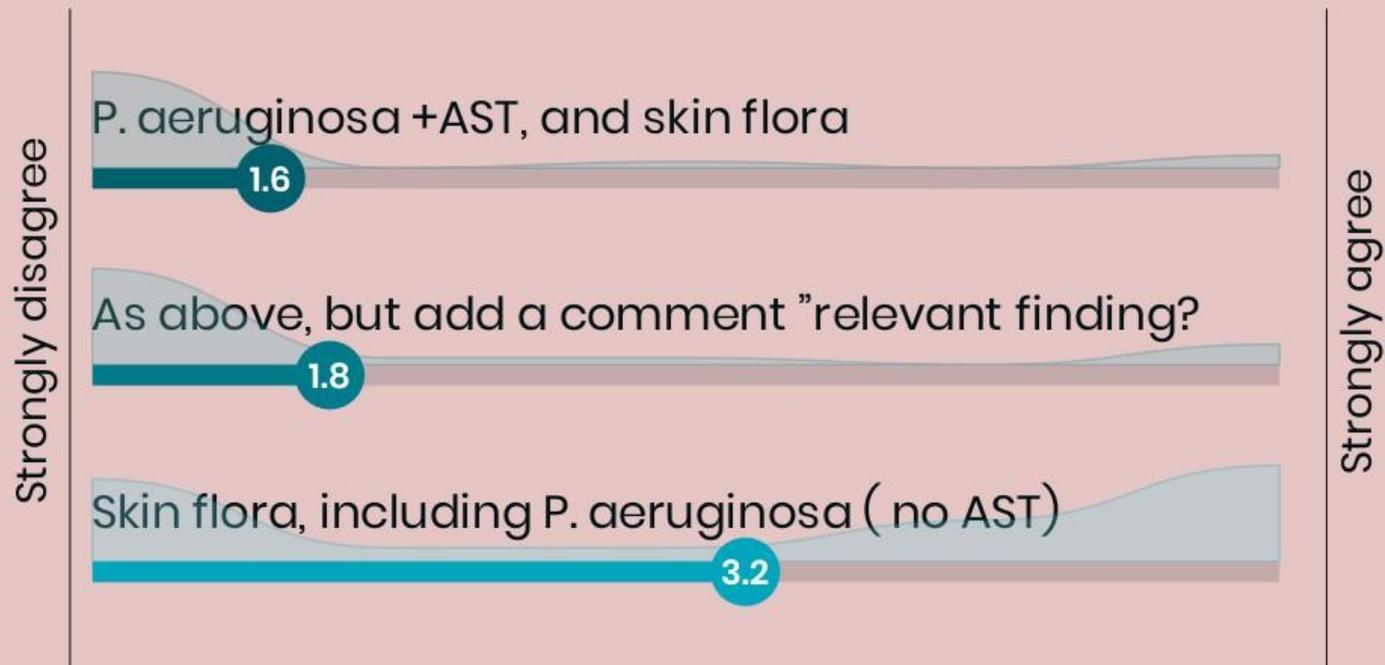


- Skin flora, including *P. aeruginosa* (no AST)



Respos from auditorium:

Which response would YOU use



This information was given

- Elderly lady with chronic ulcer by the ankle
- Now increased secretion, redness around the ulcer and increased pain. Slight edema.
- No fever
- Wound-culture has been taken
- Two alternative ulcers, but the same anamnesis

A)



B)



How did they respond

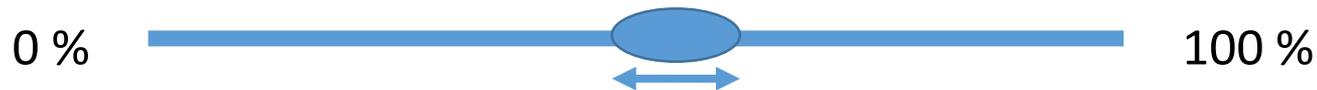
I would treat with antibiotics
if the respon was as follows?



- Växt av Staph. aureus, med resistens-bestämning, samt hudflora



- Om det också stod "kliniskt relevant fynd?"

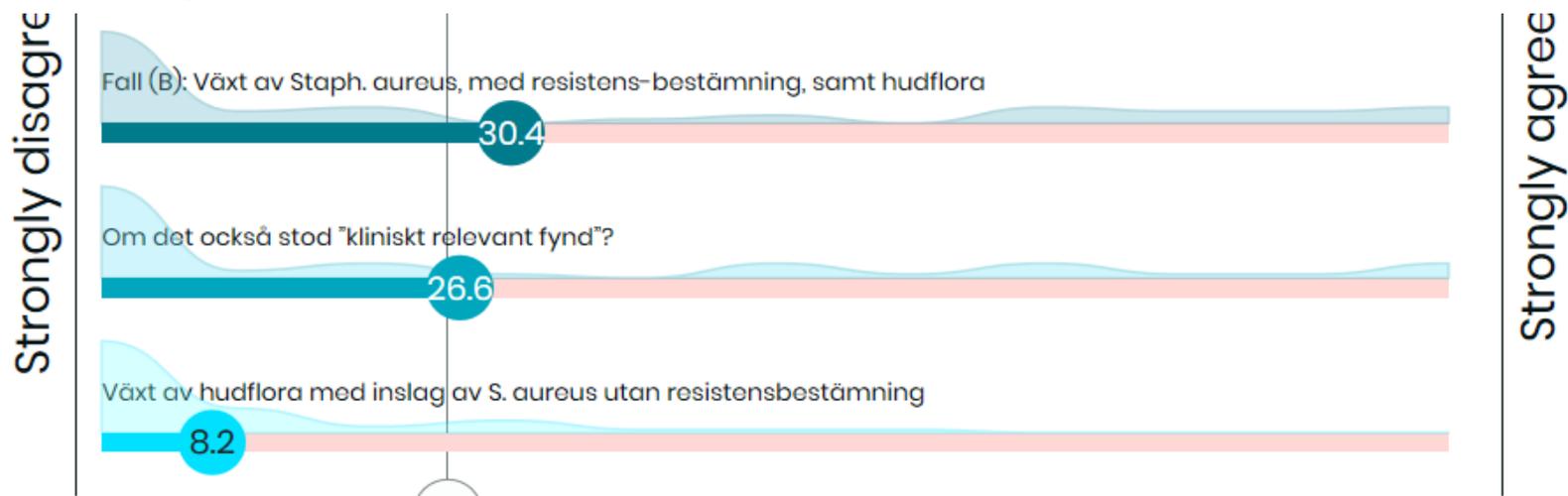


- Växt av hudflora med inslag av S. aureus utan resistensbestämning

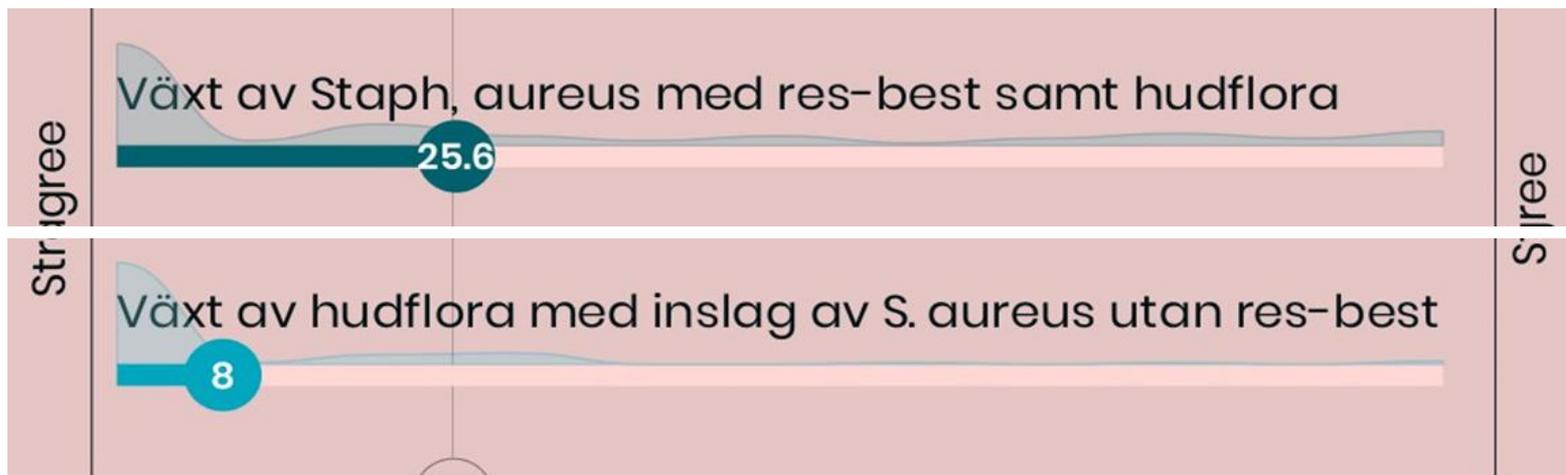


Strama i VGR – educational workshops – responses

Hospital care



Primary care

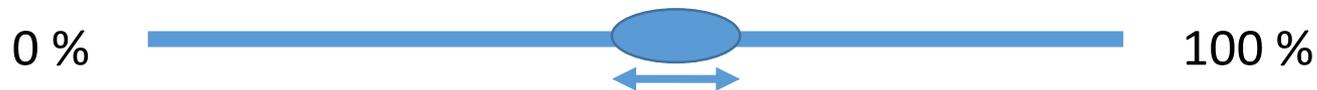


How did they respond – primary care

I would treat with antibiotics
if the respon was as follows?



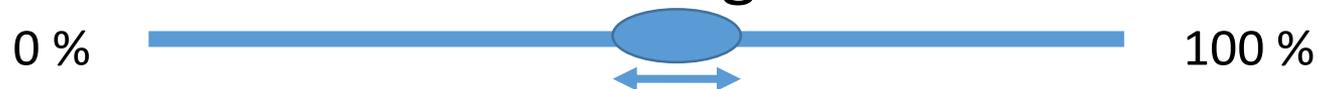
- Växt av pseudomonas, med resistens-bestämning samt gramnegativ blandflora



- Om det också stod ”kliniskt relevant fynd?”



- Växt av hudflora med inslag av pseudomonas utan resistensbestämning



Strama i VGR – educational workshops – responses

Would you treat with antibiotics....

Hospital care



Primary care



Misled ??

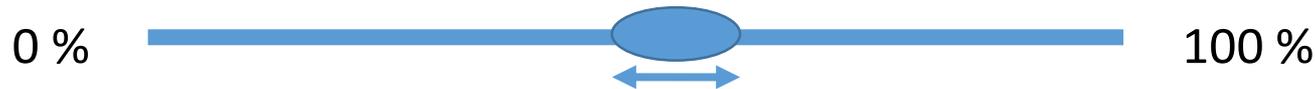
these wounds should NOT have been treated with antibiotics at all

Should lab avoid to give these AST-results (PHC)

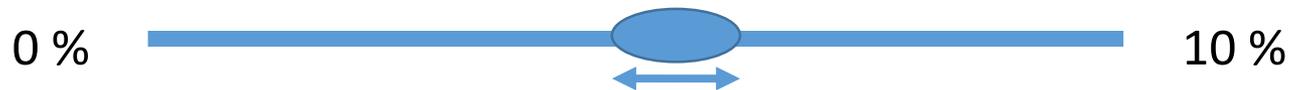
- what is **YOUR** opinion?



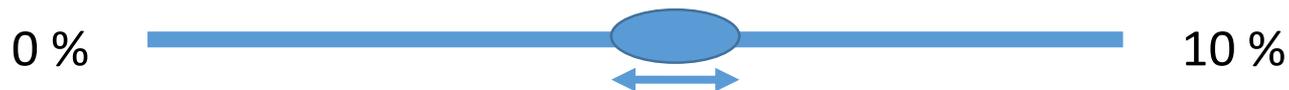
- Inte ciprofloxacin i urinodling vid afebril UVI ?



- Inte cefalosporiner i sårodling?



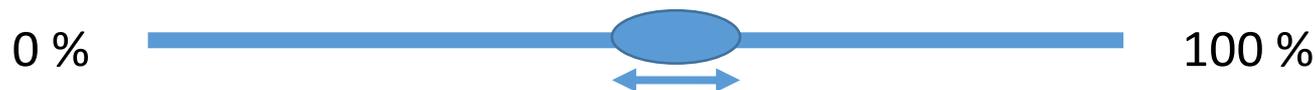
- Inte ciprofloxacin för pseudomonas i sårodling



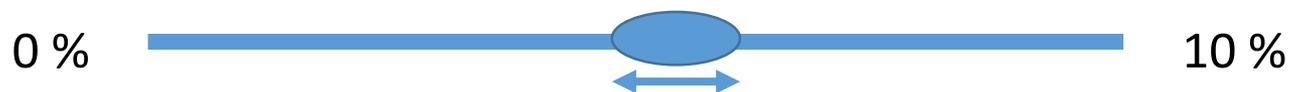
What do you think the clinicians (primary health) answered?



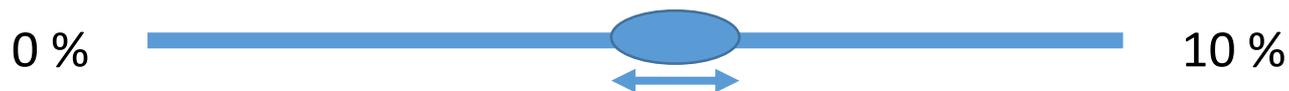
- Inte ciprofloxacin i urinodling vid afebril UVI ?



- Inte cefalosporiner i sårodling?

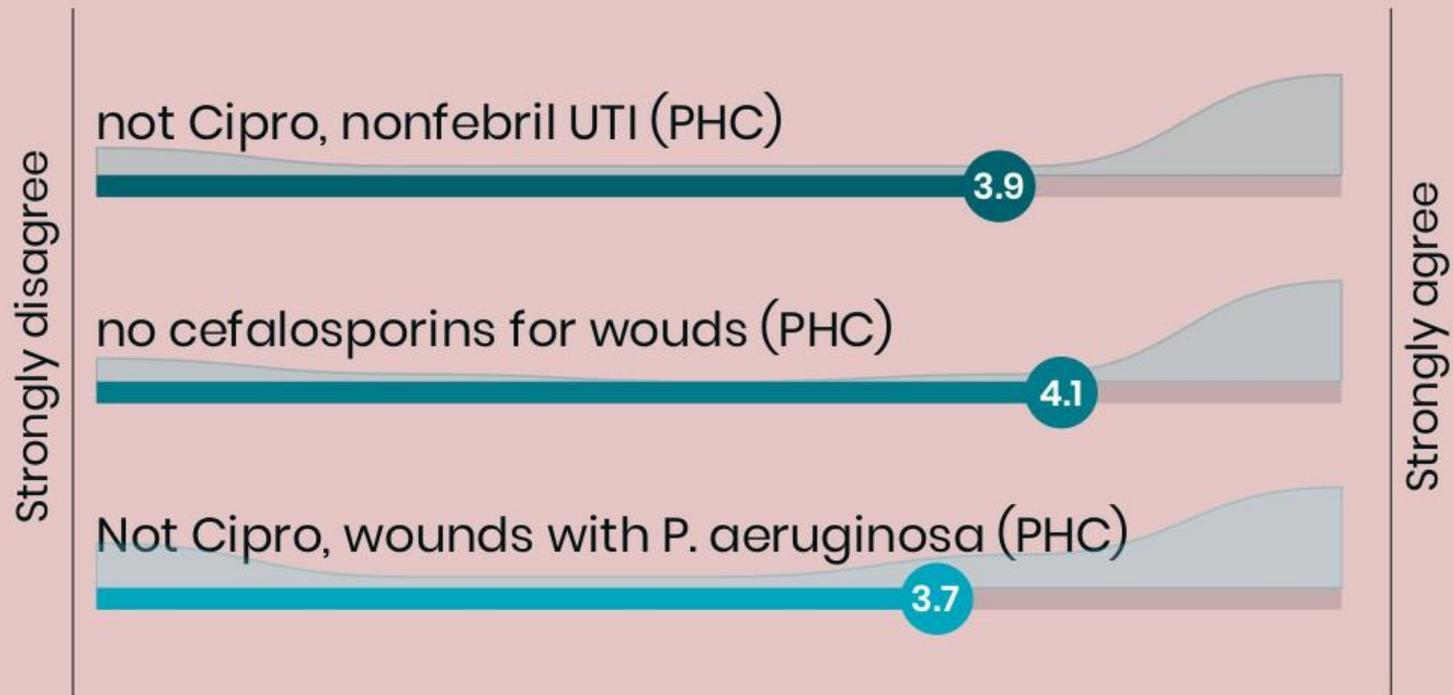


- Inte ciprofloxacin för pseudomonas i sårodling

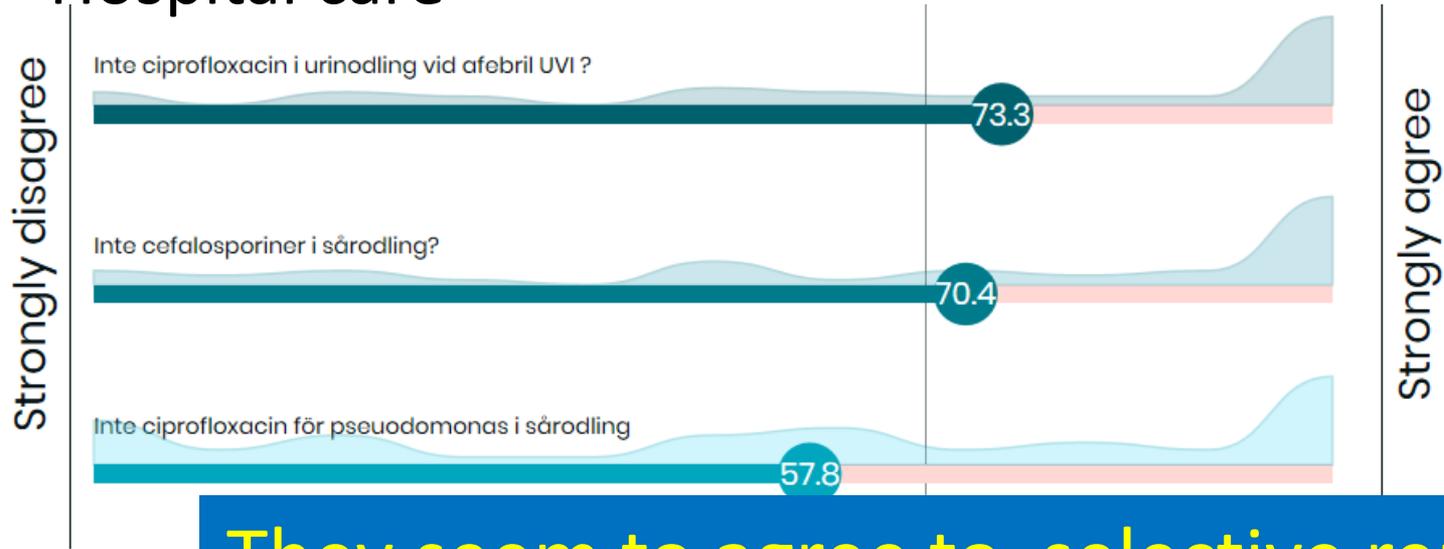


Respos from auditorium:

Should lab avoid these AST-results - YOUR opinion

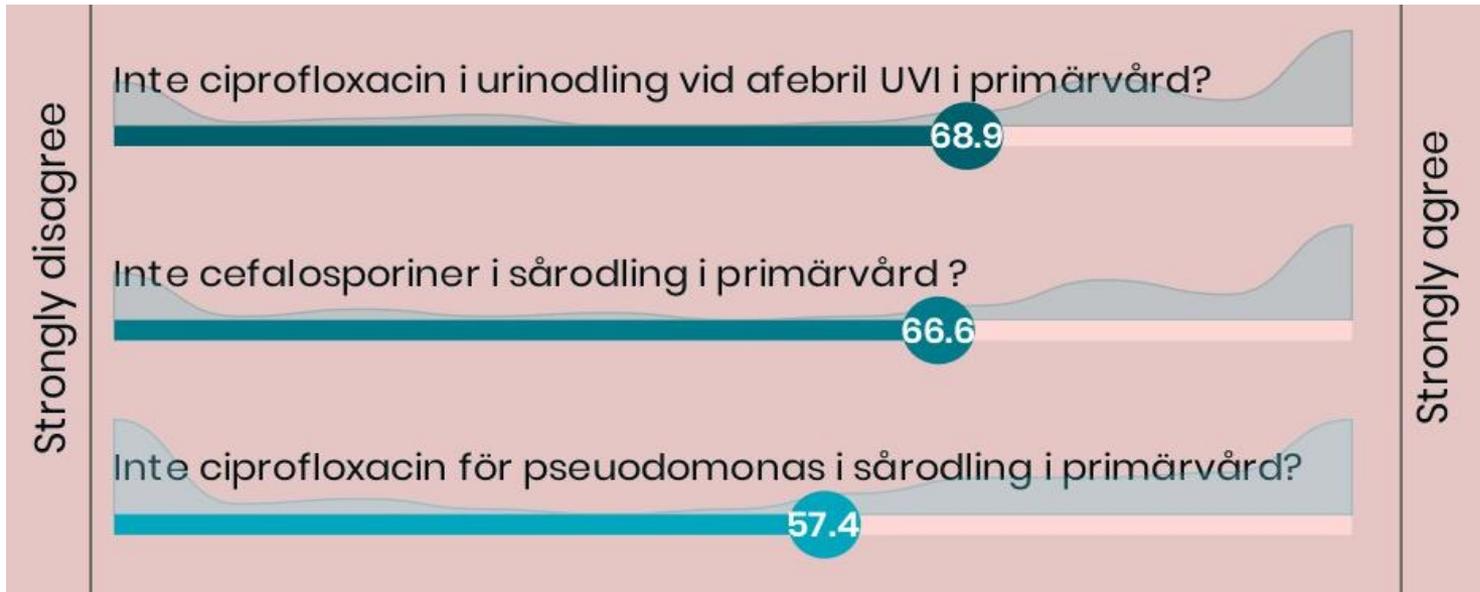


Hospital care



They seem to agree to selective reporting

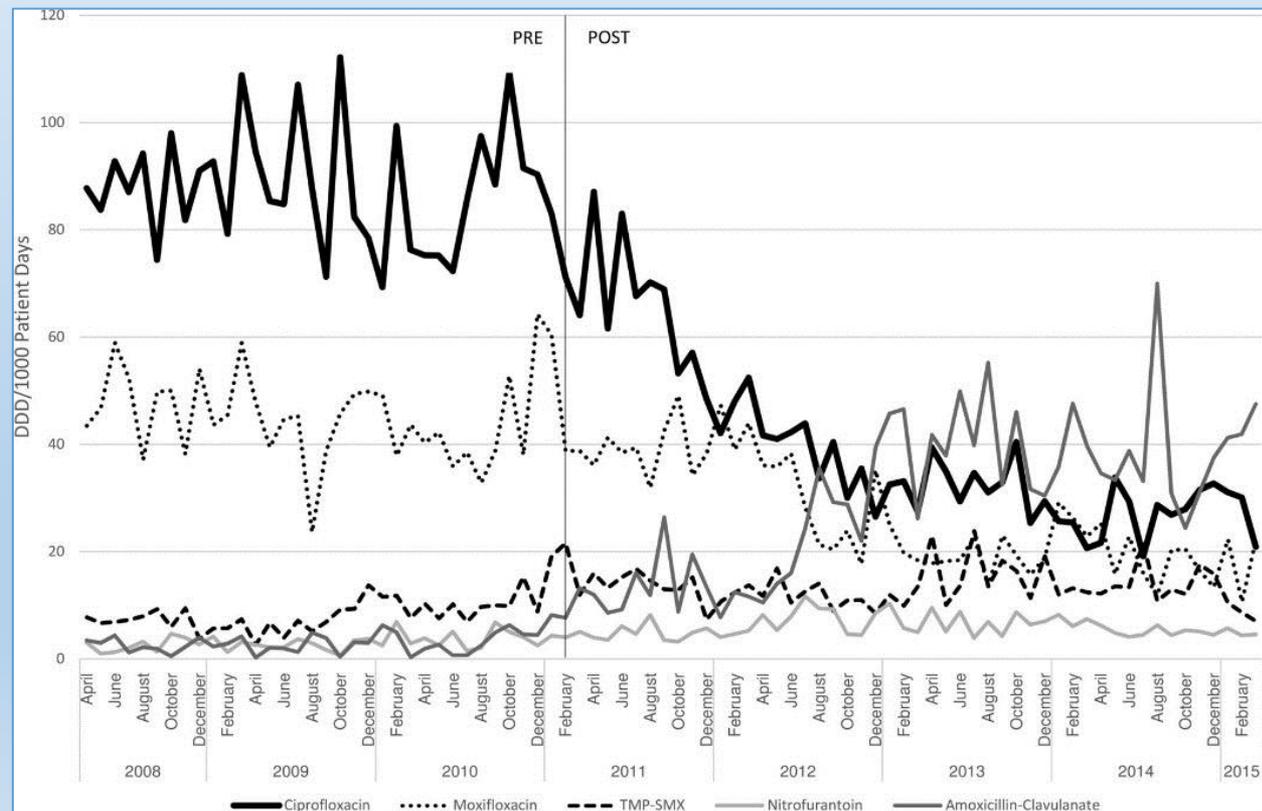
Primary care



Could lab impact the treatment based on how the answer is reported?

Selective reporting

Langford BJ, Seah J, Chan A et al. Antimicrobial Stewardship in the Microbiology Laboratory: Impact of **Selective** Susceptibility Reporting on Ciprofloxacin Utilization and Susceptibility of Gram-Negative Isolates to Ciprofloxacin in a Hospital Setting. **Clin Microbiol.** 2016 Sep;54(9):2343-7. doi: 10.1128/JCM.00950-16.



Could lab impact the treatment based on how the answer is formulated?

Selective reporting

Johnson LS, Patel D, King EA, Maslow JN. Impact of microbiology cascade reporting on antibiotic de-escalation in cefazolin-susceptible Gram-negative bacteremia. **Eur J Clin Microbiol Infect Dis.** 2016 Jul;35(7):1151-7. doi: 10.1007/s10096-016-2645-5. Epub 2016 Apr 29

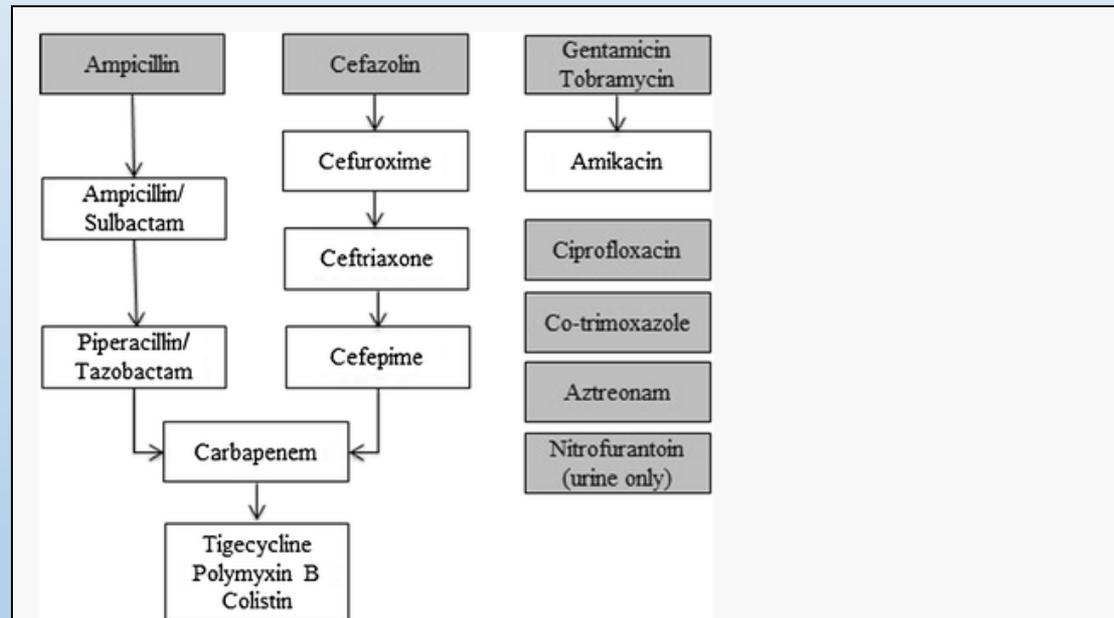


Fig. 1

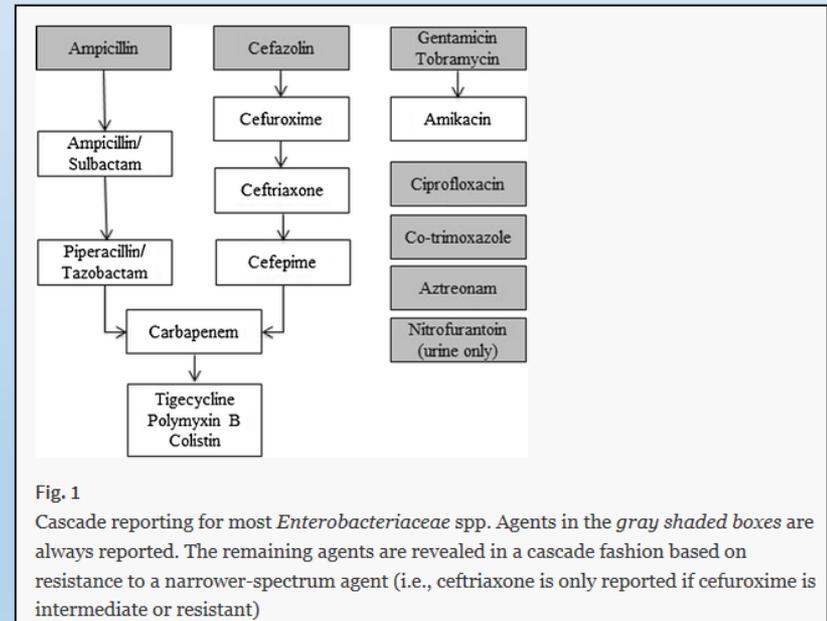
Cascade reporting for most *Enterobacteriaceae* spp. Agents in the *gray shaded boxes* are always reported. The remaining agents are revealed in a cascade fashion based on resistance to a narrower-spectrum agent (i.e., ceftriaxone is only reported if cefuroxime is intermediate or resistant)

Could lab impact the treatment based on how the answer is formulated?

Selective reporting

Johnson LS, Patel D, King EA, Maslow JN. Impact of microbiology cascade reporting on antibiotic de-escalation in cefazolin-susceptible Gram-negative bacteremia.
Eur J Clin Microbiol Infect Dis. 2016 Jul;35(7):1151-7. doi: 10.1007/s10096-016-2645-5. Epub 2016 Apr 29

- Deescalating broadspectrum betalaktamab after intervention:
71 % vs 43 % before (p=0,043)
- Unchanged outcome



No culture results in case of ABU?

Leis JA, Rebick GW, Daneman N et al. **Reducing antimicrobial therapy for asymptomatic bacteriuria among noncatheterized inpatients: a proof-of-concept study**. Clin Infect Dis. 2014 Apr;58(7):980-3. doi: 10.1093/cid/ciu010.

No culture results in case of ABU?

Urine samples were cultures but not answered:

“The majority of positive urine cultures from inpatients without an indwelling urinary catheter represent asymptomatic bacteriuria. If you strongly suspect that your patient has developed a urinary tract infection, please call the microbiology laboratory”

- Medical record reading: ABU or not?

–Proportion ABU treated decreased from **48** to **12** %!

Urinary culture day 1, hospital care (USA) (ca 41 000 patients with and without culture)

Urine Culture on Admission Impacts Antibiotic Use and Length of Stay: A Retrospective Cohort Study

Molly J. Horstman ^{(a1) (a2) (a3)}, Andrew M. Spiegelman ^(a4), Aanand D. Naik ^{(a1) (a2) (a3)} and Barbara W. Trautner ^{(a1) (a2) (a5)} 

<https://doi.org/10.1017/ice.2018.55> Published online: 27 March 2018

Abstract

OBJECTIVE

To examine the impact of urine culture testing on day 1 of admission on inpatient antibiotic use and hospital length of stay (LOS).

DESIGN

We performed a retrospective cohort study using a national dataset from 2008 to 2014.

six additional bed-days
36 607 additional days with antibiotics
In those cultured

Matching produced a cohort of 88,481 patients (n=41,070 with a culture on day 1, n=47,411 without a culture). A urine culture on admission led to an increase in days of inpatient antibiotic use (incidence rate ratio, 1.26; $P<.001$) and resulted in an additional 36,607 days of inpatient antibiotic treatment. Urine culture on admission resulted in a 2.1% increase in LOS ($P=.004$). The predicted difference in bed days of care between admissions with and without a urine culture resulted in 6,071 additional bed days of care. The impact of urine culture testing varied by admitting diagnosis.

CONCLUSIONS

Patients with a urine culture sent on day 1 of hospital admission receive more days of antibiotics and have a longer hospital stay than patients who do not have a urine culture. Targeted interventions may reduce the potential harms associated with low-yield urine cultures on day 1.

How would you react on the following report:

”Remissuppgifter saknas. Om patienten har tydliga tecken på UVI vänligen meddela lab så odlar vi provet”

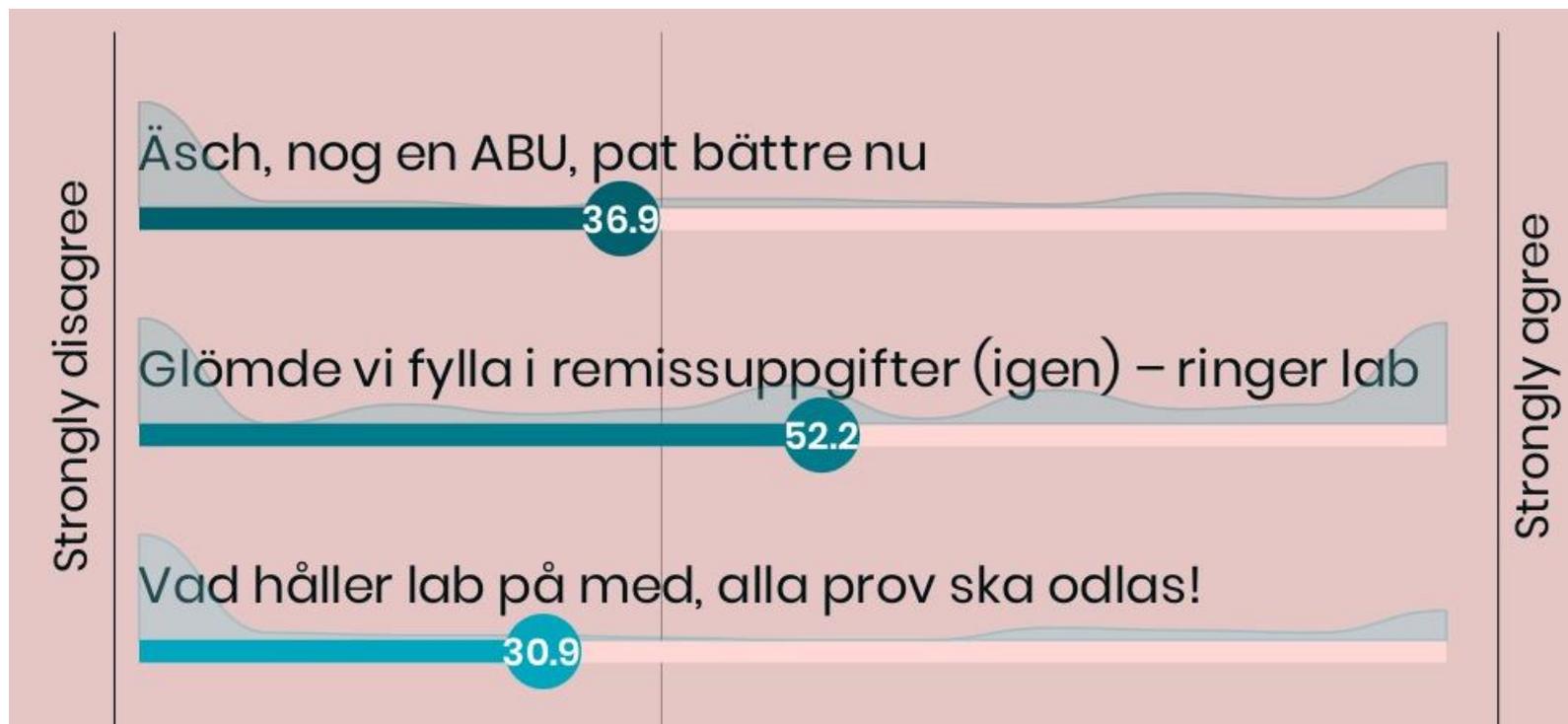
1. äsch spelar ingen roll det var nog en ABU, hon är ju bättre nu
2. men glömde vi fylla i remissuppgifter (igen) – ringer lab
3. ringer lab och undrar vad de håller på med, all prov ska självklart odlas!

How do those working in **primary care** respond

Strama i VGR – educational workshops - responses

No culture results for urin sample.....

Primary care



Should only AST for the primary recommended AB be answered ?

Exempel: if sensitive only report
S. aureus -isoxa.pc
Pneumococci - penicillin

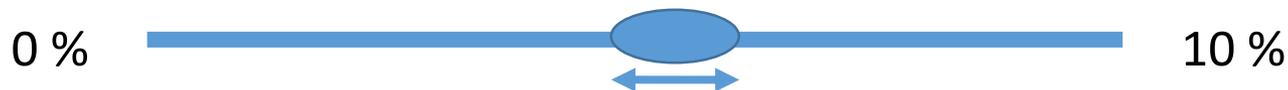


What do **YOU** think is the clinicians belief?

- Att det **bara** finns detta behandlingsalternativet?



- Att andra **vanliga** behandlingsalternativ också fungerar?



Should only AST for the primary recommended AB be answered ?

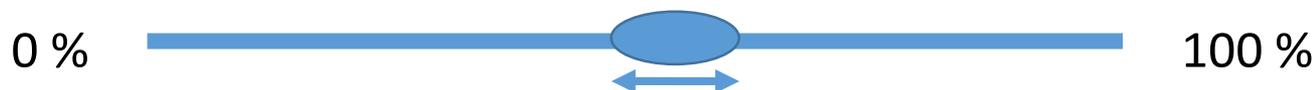
Primary care



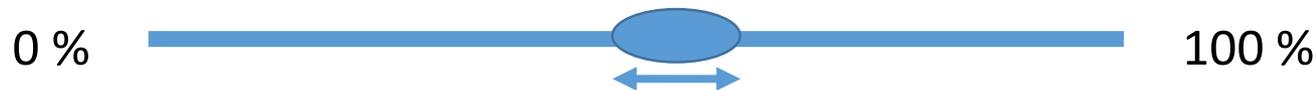
How do you react on this answer from NPT-culture from a 2 year old child:

”H. influenzae sensitive to beta-lactam antibiotics”

- Stööön - Vad är beta-lactam antibiotika?



- kan jag inte få ett res.mönster istället?



- OK, den kan jag vid behov behandla med PcV



- OK, den kan jag vid behov behandla med ampicillin



alltid

”H. influenzae sensitive to beta-lactam antibiotics”

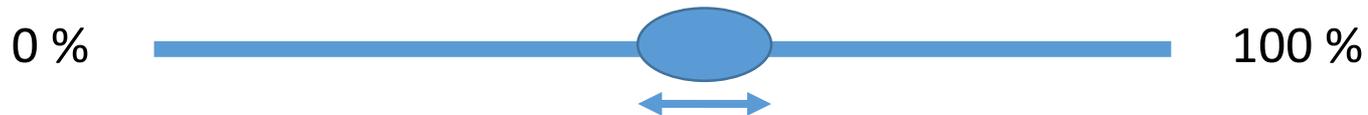
Primary care



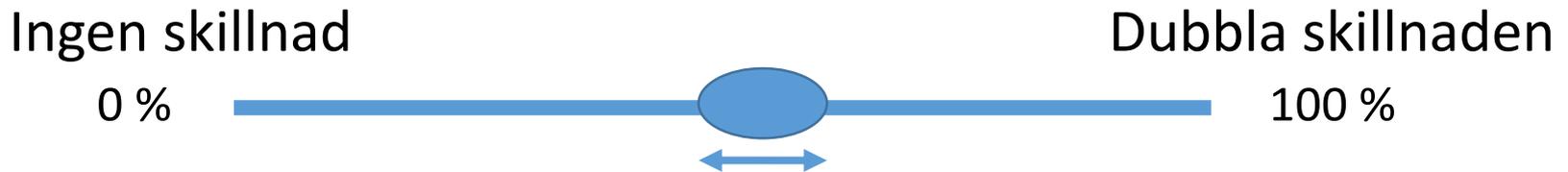
The lab. must help the clinicians

MIC (mg/L) – what do you know?

- Alltid ett säkrare resultat än mm-zoner från lapp-test?

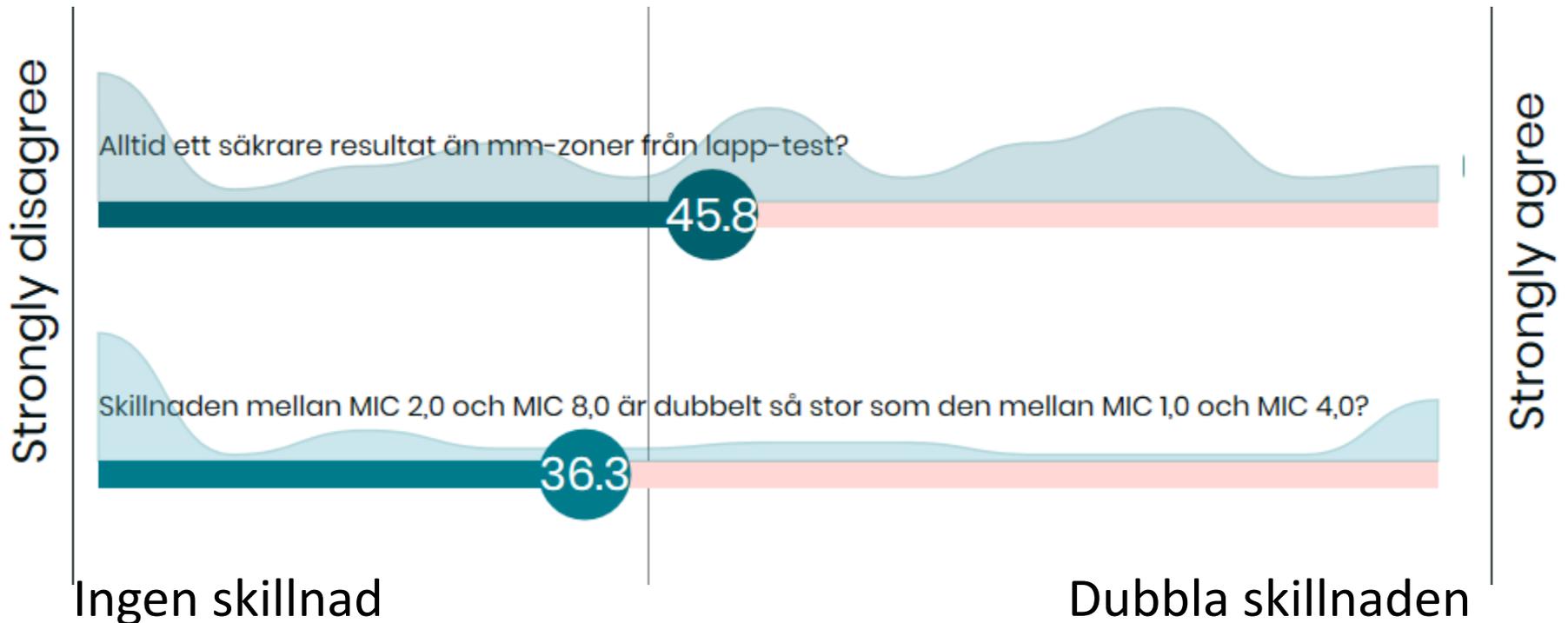


- Skillnaden mellan MIC 2,0 och MIC 8,0 är dubbelt så stor som den mellan MIC 1,0 och MIC 4,0?



Mark as you believe those working in hospital care responded

MIC (mg/L) – vad vet du om det?



The knowledge on MIC needs to increase

Facilitate local collaboration between lab and clinics

- *Collaboration between lab and clinics varies today*
- There is an **improvement** potential
- Start **discussion locally**
- Start **diagnostic ASP locally**